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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/872,311	05/31/2001	David Kar Ling Lo	13004US01	4548
7590 07/07/2004			EXAMINER	
Robert W. Fieseler McAndrews, Held & Malloy, Ltd. 500 West Madison Street, 34th Floor Chicago, IL 60661			TALBOT, BRIAN K	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 07/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/872,311

Applicant(s)

LO ET AL.

Examiner

Brian K Talbot

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 4 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13-15 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-15 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

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1. The Request for Reconsideration, filed 5/3/04, has been considered and entered. Claims 12 and 16-20 have been canceled. Claims 1-11, 13-15 and 21 remain in the application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1-4, 6-11, 13-15 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (5,935,643) or Breault et al. (5,732,463) in combination with JP-201-38268 or Maricle et al. (4,849,253) further in combination with either Koschany et al. (6,183,898 B1) or JP 9-180,729.

Song et al. (5,935,643) and Breault et al. (5,732,463) teach method of manufacturing electrode for fuel cells whereby a coating is applied to a porous substrate, dried, rolled and sintered to form the electrode. The rollers are placed having a gap distance and a protecting film is situated between the electrode and the roller to avoid sticking during compaction.

Song et al. (5,935,643) or Breault et al. (5,732,463) fail to teach that the process is continuous.

It is the Examiner's position that one skilled in the art at the time the invention was made would have had a reasonable expectation that the above processes would produce the expected results in either a continuous or non-continuous process.

Song et al. (5,935,643) and Breault et al. (5,732,463) fail to teach the coating having a liquid component during the rolling/compacting step.

JP-201-38268 teaches manufacturing a fuel cell electrode whereby a liquid mixture is applied to a heated roller and then pressing the liquid mixture to form the electrode. While the reference teaches a “heated” roller, the reference does not “completely dry” the coating prior to pressing.

Maricle et al. (4,849,253) teaches method of making electrochemical cell electrode whereby the catalyst layer is applied and compacted prior to being sintered to form the electrode (Abstract and Fig. 1).

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have modified either Song et al. (5,935,643) or Breault et al. (5,732,463) process by not completely drying the coating prior to pressing/compacting as evidenced by either JP-201-38268 or Maricle et al. (4,849,253) with the expectation of achieving similar success.

Song et al. (5,935,643) or Breault et al. (5,732,463) in combination with JP-201-38268 or Maricle et al. (4,849,253) fail to teach forming a fluid diffusion layer substantially free of electrocatalysts (i.e. an electrocatalyst layer is applied to a formed fluid diffusion layer).

Koschany et al. (6,183,898 B1) (abstract and examples 1-4) or JP 9-180,729 (abstract) both teach fuel cells having a gas diffusion layer whereby a catalyst layer is applied thereto for the formation of the electrode.

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have utilized Song et al. (5,935,643) or Breault et al. (5,732,463) process by not completely drying the coating prior to pressing/compacting as evidenced by either JP-201-38268

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or Maricle et al. (4,849,253) process to have formed the diffusion layer separately and then the catalyst layer as evidenced by Koschany et al. (6,183,898 B1) or JP 9-180,729.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (5,935,643) or Breault et al. (5,732,463) in combination with JP-201-38268 or Maricle et al. (4,849,253) further in combination with Koschany et al. (6,183,898 B1) or JP 9-180,729 still further in combination with Campbell et al. (5,863,673).

Song et al. (5,935,643) or Breault et al. (5,732,463) in combination with JP-201-38268 or Maricle et al. (4,849,253) further in combination with Koschany et al. (6,183,898 B1) or JP 9-180,729 fail to teach pre-treating the substrate with a hydrophobic polymer before applying the coating material.

Campbell et al. (5,863,673) teaches forming a porous electrode for a fuel cell whereby a hydrophobic coating is applied prior to the filling step. (col. 3, lines 64-67)

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have modified Song et al. (5,935,643) or Breault et al. (5,732,463) in combination with JP-201-38268 or Maricle et al. (4,849,253) further in combination with Koschany et al. (6,183,898 B1) or JP 9-180,729 process with a hydrophobic coating as evidenced by Campbell et al. (5,863,673) with the expectation of achieving similar results.

Response to Amendment

4. Applicant's arguments filed 5/3/04 have been fully considered but they are not persuasive.

Applicant argued that the prior art failed to teach forming a fluid diffusion layer substantially free of electrocatalyst and not a process for forming a fluid diffusion electrode.

The Examiner agrees in part. However, as noted by Applicant and cited by the Examiner, Koschany et al. (6,183,898 B1) or JP 9-180,729 both teach fuel cells which include forming separate fluid diffusion layers and catalyst layers to form the electrode. Hence, it is the Examiner position that one skilled in the art at the time the invention was made would have had a reasonable expectation of achieving similar results regardless of the final product produced, i.e. a diffusion layer or diffusion layer electrode. The prior art teaches both products.

In addition, Applicant stated:

“None of the pending claims defines a method of preparing a fluid diffusion electrode, although the fluid diffusion layer prepared using the applicants' claimed method could be employed in the preparation of an electrode.”

This is contrary to the subject matter recited in claims 7 and 8 whereby an electrocatalyst layer is applied to the diffusion layer to form an electrode.

“Claim 7 (original): The method of claim 6, further comprising:

(e) continuously applying an electrocatalyst composition comprising at least one electrocatalyst to the fluid diffusion layer; (f) continuously compacting the fluid diffusion

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layer and the electrocatalyst applied thereto by applying pressure from at least one roller; and(g) drying the fluid diffusion layer and the electrocatalyst composition applied thereto; whereby the fluid diffusion layer and the electrocatalyst form an electrode.”

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 6AM-3PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1428.

A handwritten signature in black ink, appearing to read "Brian K Talbot". The signature is stylized with a large, cursive "B" and "T".

Brian K Talbot
Primary Examiner
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BKT